UNIVERSITI TEKNOLOGI MARA

COMPARATIVE STUDY ON USING *CERBERA ODOLLAM* OIL AND PALM OIL FOR MICROBIAL LIPASE PRODUCTION

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of the requirements for the degree of
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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any academic institute or non-academic institution for any other degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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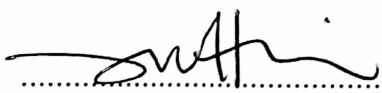
Signature of Student	:	
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ABSTRACT

Research on useful application of *Cerbera odollam* in Malaysia is relatively few despite its abundance mainly due to its toxicity. In order to utilize this plenty natural resource, the *Cerbera odollam* oil was extracted from the fruit's seed. The yield from the extracted oil achieved was at 53% (w/w) oil. On the other hand, bacteria known as *Pseudomonas aeruginosa* ATCC 27853 was able to grow in the agar medium containing *Cerbera odollam* as base media. This finding led to the use of this microbe to enhance lipase production by *Cerbera odollam* oil as a carbon source in the fermentation media. Similar fermentation using palm oil was carried out as comparison. There has been found that 3% (v/v) of oil produced maximum activity for media of *Cerbera odollam* oil compared to 5% (v/v) optimum of palm oil with activity 199 mU/mL and 189 mU/mL respectively. Lipase production secreted high activity when initial pH 7 was applied and the maximum activity achieved was 199 mU/mL and 134 mU/mL for *Cerbera odollam* media and palm oil media respectively after incubation of 72 hour. The temperature of 37°C was found as the optimum condition with activity 200 mU/mL and 146 mU/mL for *Cerbera odollam* oil media and palm oil media respectively. Other study showed that lipase activity from both produced media was found to be stimulated by the addition of ion Ca^{2+}, Cu^{2+}, Li^{+}, and Mn^{2+}only stimulated palm oil produced media. The optimum conditions by response surface methodology revealed that the maximum activity for *Cerbera odollam* oil production media is 219 mU/mL for optimum condition at 44°C, 3.4% (v/v) of *Cerbera odollam* oil and at 55 hour. Furthermore, the maximum of lipase activity of 210.76 mU/mL has been produced by Palm oil production media at optimum condition of 46.3°C, with concentration 6.3%(v/v) of palm oil and at 48.6 hour.

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